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The Heavens Are Telling: A Biblically Informed Cosmology

Grenville J. Kent
Avondale College of Higher Education, grenville@rema.tv

Chapter 12

THE HEAVENS ARE TELLING: A BIBLICALLY INFORMED COSMOLOGY

Grenville J. R. Kent[1]

> "The human race is just a chemical scum on a moderate-sized planet, orbiting around a very average star in the outer suburb of one among a hundred billion galaxies. We are so insignificant that I can't believe the whole universe exists for our benefit."
> –Professor Stephen Hawking[2]

> "When I consider the heavens, the work of your fingers . . . what is man, that you are mindful of him?" –David (Psa 8:3-4)

One starry night I was singing to my wife, Carla, a romantic old love song:

> *Fly me to the moon. Let me play among the stars.*
> *Let me see what spring is like on Jupiter and Mars.*

Then I actually thought about the words. "Is he trying to kill her?" I said. "The moon has minimal gravity and no atmosphere. A star is a sustained thermonuclear explosion that emits unthinkable heat and more deadly radiation per second than a trillion Hiroshimas. Jupiter is made of gas and its gravity is 2.3 times that of Earth. So she would weigh 2.3 times as much – how depressing. And she would freeze, because its temperature is about minus 150 degrees Celsius. Mars is freezing too." Carla laughed and kissed me goodnight – but the unromantic truth is that space is not friendly to human life. There is no spring on Jupiter and Mars.

So why is Earth "just right" for human life? For a planet to support life (and astrobiologists are currently searching the cosmos for bio-friendly planets), there are many factors that have to exist within very precise parameters.[3] These include the following:

Distance From Star. The planet needs to be the right distance from the parent star. Venus is too close to our sun, and has a huge greenhouse effect at 460 degrees Celsius. Unmanned missions there last only a few hours. So Venus couldn't support life. Mars is too far away and freezing cold. We live on Earth, which is between them, in the "habitable zone" of our solar system with abundant liquid water, which is essential to life as we know it. This is also known as the Goldilocks zone, because it is "just right," like Mother Bear's porridge. A 2 percent change in our orbit either nearer to the sun or further away, would probably wipe out all life on Earth.[4]

The Right Kind of Star. The planet also needs the right kind of parent star: red giants and white dwarfs are highly unlikely to support life. Red dwarfs have only a small habitable zone, but main sequence stars, like our sun, are ideal. Yet if the sun had 20 percent more or less mass, Earth would

be hotter than Venus or colder than Mars and hostile to life.[5]

Orbit Shape. Some planets orbit distant stars with elliptical orbits so long that their oceans, if they had any, would boil when in proximity to the sun and freeze at the outer extremes. Earth's orbit is almost a perfect circle, known to be ideal for the existence and continuity of life.

Spin Rate. Mercury is the closest planet to the sun and its sunny side can reach 465 degrees Celsius. Yet Mercury spins very slowly – its day equals fifty-nine earth-days – and so its dark side is minus 185 degrees Celsius. Fortunately Earth rotates about every twenty-four hours, keeping temperatures fairly consistent and giving most of us dark nights for sleeping.

Rotation Angle. Earth's spin axis is tilted at an angle of 23.5 degrees, which gives us the seasons of the year: when the Northern Hemisphere is leaning away from the sun, it's winter there. A higher angle would mean severe seasons, but fortunately the mass of our moon is large enough to keep Earth's tilt stabilized. The moon's gravitational pull also attracts our oceans and causes tides that stir and cleanse, but is not big enough to pull us out of orbit.

Magnetic Field. We need protection from all the dangerous radiation in space, like the solar wind, which is a stream of electrically charged particles. Fortunately Earth has a magnetic field, thanks to a concentration of molten iron at its core and its moderate rotation rate. But if Earth's magnetic field were much stronger, we would probably experience very severe electromagnetic storms.[6] Again, just right.

There is life on Earth because the combination of all the necessary conditions makes it possible. Gonzalez and Richards rightly call our earth "the privileged planet," since it exists and supports life thanks to a unique set of circumstances. As yet we know of none like it in the entire cosmos.

Astronomical...

Then there is gravity itself, which operates across astronomical distances. It will help if we can try to visualize the vastness of the universe.

Our solar system is about nine thousand million kilometers across, measured from Neptune's orbit. (We could nearly triple that figure if we counted dwarf planets like Pluto or Eris, or make it ten million, million kilometers if we included comets in the Oort cloud, but we'll stay with the conservative figures.) To grasp that, imagine the fastest space vehicle developed so far, the unmanned Helios solar probe, which travels at 253,000 kilometers per hour, about 260 times faster than a passenger jet. At this staggering speed, it would still take over four years to cross our solar system.

Measured in this way, our solar system is only about 0.0009 light-years in diameter, while the Milky Way galaxy is one hundred thousand light-years across. The Milky Way contains two hundred or perhaps as many as four hundred billion stars like our sun. Yet our sun, which is only an average-sized star, could contain about a million planets the size of Earth. A star in Orion named Betelgeuse could fit in over a million suns the size of ours.[7] And there are even bigger stars than that.

It used to be thought that our galaxy was about all there was, but estimates from the Hubble space telescope now suggest one hundred billion galaxies, each with one hundred to two hundred billion stars, many of them probably with planets revolving around them. The nearest galaxy to our own Milky Way is called Andromeda, some 2.54 billion light-years away. This distance sounds awesome. But the observable universe is now calculated at twenty-eight billion light-years across. And that's only what astronomers can observe at the present time.

The Milky Way is both rotating and moving relative to surrounding galaxies – think of a merry-go-round on a truck – so our sun with its planets is moving around the Milky Way at 250 kilometers per second, while also moving through space at 630 kilometers per second. Yet even on this scale it appears that things have been finely tuned to allow for human life. Earth seems to have the best location not just in our solar system but also in our galaxy. It is not too near the center of the galaxy,[8] where X-rays and gamma radiation from the black hole could incinerate us, and where thick traffic would make fatal collisions and gravity disturbances more likely, not to mention danger from exploding supernova. Earth is located on the inner edge of one of the galaxy's spiral arms, which may protect us from radiation. It is also sufficiently removed from the cosmic dust and debris contained within the arms themselves. From this vantage point we are able to observe the rest of the cosmos, or much of it, a fact in itself of great significance.

Gravity

Galaxies can merge into clusters and superclusters, attracted by gravity working across those enormous distances. But gravity also works on a small scale, holding us firmly on to our planet. Gravity is one of the four most basic forces of nature, along with the electromagnetic force and the strong and weak nuclear forces. And the gravitational constant G, or Big G, which helps calculate the attraction between objects with mass as described by Newton's laws of universal gravitation and Einstein's theory of relativity, is again just right. If its strength were smaller, everything would just fly apart. If it were bigger, atoms would jam together, the orbits of stars would contract, stars would squeeze in on themselves and burn faster and our sun would be one thousand times brighter.[9] In short, we would not exist if Big G had a different value.

Beyond this, the relationship between gravity and the three other forces is delicately fine-tuned.[10] To take just one example, if the ratio of the nuclear strong force to the electromagnetic force were different by only one in one hundred thousand million, million (10^{17}), no stars would form. So gravity is stunningly fine-tuned in itself, along with other forces that have just the right settings and values to allow life to exist on Earth.

There are about thirty "coincidences" or examples of apparent fine-tuning now known, according to Paul Davies in *The Goldilocks Enigma: Why Is the Universe Just Right for Life?* He counts twenty from physics and ten from cosmology.[11]

Why This Fine-Tuning?

Space is mainly a dead zone with no air, fatal radiation and gigantic players that could crush Earth and extinguish all life on it within seconds. And yet there is a tiny corner of the universe that allows us to live, to think, to look out at the cosmos before us and to wonder. Why should this huge galactic theater have a role for human beings? Why should its settings allow us to live and give us the privileged role of observers? This is often called the cosmic anthropic principle. Those who have thought about it[12] offer several various explanations:

Don't Ask. This question has often been treated with casual concern or considered off limits. The atheist philosopher Bertrand Russell famously once observed, "I should say that the universe is just there, and that's all."[13] Physicist Edward Tryon feels "our Universe is simply one of those things

which happen from time to time."[14] Others say that obviously we're in a universe that supports life, or else we wouldn't be having this discussion – so there's nothing really surprising in it.

But philosopher John Leslie[15] asks us to imagine that after a huge firing squad shoots right at us, we find we have survived. Would we then say, "Of course I survived or I wouldn't be here, so there's nothing surprising about that"? Or would our first question be, "How did that happen?"

Chance. Many scientists say we are here by chance. Yet many acknowledge that the chances of intelligent life existing anywhere in the universe are astronomically low, almost impossibly low, since all these settings have to be right *at the same time*.

Astronomer Hugh Ross[16] identified 140 settings that must be just right for life to exist in the universe, and 922 factors necessary for one life-supporting planet to appear anywhere in the universe, and calculated the probability of each of them occurring at the same time. He found that it was lower than 1 in 10^{311}. That number is staggeringly formidable. It equals the number of atoms in the known universe *times* the number of atoms in the known universe, *times* the number of atoms in the known universe, *times* the number of atoms in the known universe, *times* one hundred million billion, billion, billion, billion, billion, billion, billion.[17]

And this almost unthinkable number describes the odds of getting just one planet ready for human existence. In a universe without God it would be necessary to take these odds and *multiply* them by the odds of the first living cell forming by chance, then by the chances of step-by-step evolution (an enormous number in itself) producing the first human. Unlikely things do happen, but all this is so far beyond the probability bound that it is, in reality borderline impossible.

Many scientists claim that the universe mysteriously just happens to permit life, and that we humans are an irrelevant accident in a vast meaningless cosmos. This is easy (and fashionable) to say – but would it actually encourage science to keep looking for order and understanding of the laws that govern life, and to assume that the universe is a rational place? Or does the claim border on the surreal?

String Theory. This view suggests that "the beginning of the universe was governed by the laws of science and doesn't need to be set in motion by some god."[18] Stephen Hawking believes there is a deep underlying unity to physics, a mathematical theory that can explain all, if only we could determine what it was. It may be string theory or M theory, and some very intelligent people are trying to discover it, Hawking among them. I hope they do, and then my questions will be: Why does this most elegant formula exist? Did it arise randomly, by sheer chance, with no thought behind it, or does an elegant law suggest a brilliant Lawmaker? Why is the human mind capable of understanding it? Why do we have a mind in the first place?

Professor Hawking's famous comment about "chemical scum" is witty, but I do not believe he is chemical scum. He has an incredible mind and an amazing spirit that have enabled him to achieve so highly despite great physical handicap. In my opinion, he still bears the image of his Creator even in an imperfect world. Nor do I think that you or I are chemical scum either. The evidence suggests a more encouraging conclusion. We are capable of love and empathy, of original thought, of creativity. We have rational powers of analysis and deduction, and an innate appreciation of beauty. And we have the intuition that our lives matter.

Multiple Universes. This theory holds that there are many other parallel universes that we are unable to perceive, each one with different physical constants, but that ours is the one that allows

human life. Some very intelligent people are playing with this idea. Yet if these universes are, by definition, unobservable, then can they be the legitimate subject of scientific inquiry? Or does this belong more in the realm of science fiction? Is this physics or metaphysics?[19] A multiverse seems extremely complicated and fanciful when one Creator is a much simpler and more elegant explanation of the evidence.

Simulation. We may just be characters in a giant cosmic game – perhaps titled Earth 1.0 or, for all we know, Earth 100,000.2 – operated by God or some superadvanced civilization. Some serious thinkers are also playing with this idea.

Designer. Many scientists have concluded that the precision and beauty we see in the universe is best explained by a designing mind. Professor Fred Hoyle was an atheist, but in studying how stars form the carbon on which our life is based, he noticed that the energy levels in the molecule had to be at a very precise setting that statistically was extremely unlikely. He wrote,

> Would you not say to yourself, "Some super-calculating intellect must have designed the properties of the carbon atom, otherwise the chance of my finding such an atom through the blind forces of nature would be utterly miniscule?". . . A common-sense interpretation of the facts suggests that a superintellect has monkeyed with the physics, as well as with chemistry and biology, and that there are no blind forces worth speaking about in nature. The numbers one calculates from the facts seem to me so overwhelming as to put this conclusion almost beyond question.[20]

Hoyle was so shaken by this discovery that he began to think there was a guiding force in the universe.

There is a long list of great thinkers who have seen design in the elegance and function of the universe and the human-friendliness of our little corner of it, and the fact that we have minds that can make sense of it. Nobel Prize-winner Arno Penzias found that the universe matched what he would expect to find after reading the Bible. Sir Isaac Newton wrote of the solar system, "This most beautiful system of the sun, planets, and comets could only proceed from the counsel and dominion of an intelligent and powerful being."[21] Belief in God has not stopped such thinkers from asking questions about how these things have happened. In fact, it has made them expect precise laws and complex processes instead of mindless chaos, and has inspired them to keep asking deep questions.

Yet there is a more basic question: Why is there anything at all? Thinkers since Plato and Aristotle have looked for the "First Cause" of the universe and for a "Sufficient Reason" for the existence of everything. This is sometimes called the "cosmological argument" for the existence of God, and it was developed by the Kalaam school of Islamic philosophy as well being held by many Jewish and Christian thinkers. Philosophers William Lane Craig[22] and Richard Swinburne make a strong and nuanced case for God's existence based on this argument in various forms.

It seems increasingly clear that the universe must have been caused by something outside itself. Beyond its complexity and precision, its sheer beauty also suggests an artist, a superintelligence. This God seems much bigger than religions have conceived or the human mind can fully know. Yet such a Being would be the most fascinating, intriguing, awe-inspiring identity in the universe ever to have existed.

And if God is interested in human life, as the evidence suggests, then wouldn't that mean that

humans are not chemical scum, but loved children, alive with a purpose? The Bible repeatedly emphasizes that human existence is intentional. It says, "The highest heavens belong to Yahweh, but he has given the Earth to the children of Adam" (Psa 115:16). Further, it describes God's intentions for Earth: "he created it to be inhabited" (Isa 45:18). We are here by divine purpose.

With all this in mind, we now turn to the Bible to explore one of its major cosmological statements, expressed in poetry. C. S. Lewis called it "one of the greatest lyrics in the world."[23] Here is my translation:

Psalm 19

(To the chief musician: A Psalm by David.)

[1] The heavens are telling the glory of God
And the sky announces his handiwork,
[2] Day to day pouring out speech,
Night to night revealing knowledge.
[3] There is no speech. There are no words.
Their voice is not audible,
[4] Yet their message goes throughout the world,
Their words to earth's furthest reaches.
In the heavens he has pitched a tent for the sun,
[5] Which is like a bridegroom bursting out of his room,
And like a champion who loves running his course.
[6] At one end of the heavens he bursts out
And his circuit reaches the other end.
Nothing can be hidden from the heat.
[7] The Torah-revelation of Yahweh is perfect,
Restarting your life.
The testimony of Yahweh is sure
Making a simple person wise.
[8] The teachings of Yahweh are right
Bringing joy to the heart.
The commandment of Yahweh is pure
Bringing light to the eyes.
[9] The fear of Yahweh is clean
Enduring forever.
The judgments of Yahweh are truth
And altogether righteous.
[10] They are more desirable than gold dust,
Worth more than a pile of ingots.
They are sweeter than honey,
Dripping from the honeycomb.
[11] Even more, they illuminate your servant.
Keeping them is its own reward.
[12] Who can know their own unconscious errors?
Cleanse me from hidden faults.
[13] And hold me back from deliberate sins –
I'm your servant,
Don't let them rule me.
Then I will be sound,
And innocent of the great transgression.
[14] Let the words of my mouth
And the musings of my inmost self
Be pleasing to you, O Yahweh, my Rock, my Redeemer.

Three movements. This remarkable poem falls into three parts or movements:[24]

1. Admiration of the heavens, especially the sun, as showing God's glory (vv. 1-6)
2. Admiration of the Torah or Written Word of God[25] as improving human life (vv. 7-11)
3. Asking for redemption from personal sinfulness (vv. 12-14)

We should notice the names for God in each part and how they are used:

1. *El*, the generic term for God, used once.
2. *Yahweh*, Israel's special, covenant name for God,[26] used six times. To a Hebrew ear, six uses would have sounded incomplete, like an unresolved chord, because seven is the number of God and perfection.
3. *Yahweh*, used a satisfying seventh time as part of a threefold name,[27] together with "*my* rock and *my* redeemer" – intensely personal titles. The song's last note carries the word "redeemer" (Hebrew *goel*). This meant a relative who came to the aid of someone who had fallen into debt so badly that they were about to be sold into slavery, and who spent his own money to buy back (redeem) that unfortunate person. This practice was known in the Torah,[28] but was often used as a picture of God redeeming people from literal slavery or from slavery to sin.[29] This is clear imagery of the gospel,[30] in which Christ paid our huge moral debt accrued by sin. Paul recognized this: "You know the grace of our Master Jesus the Messiah, who though he was rich made himself poor for our sakes, that through his poverty we might become rich" (2 Cor 8:9).

These three parts of the poem are distinct,[31] yet they work together as literature and as theology. They are linked by the theme of speaking:[32]

1. The heavenly bodies speak silently, and their wordless words go without translation to people of every language.[33]
2. Yahweh speaks in the Torah. His character can be discerned in this kind advice.
3. The poet speaks to God, asking that his words and even his silent inner dialogues[34] will be pleasing. This would make him like the stars, which, with silence and "speech," bring glory to God.

Running through these three parts there is also a theme of illumination of hidden things:[35]

1. The sun illuminates everything and nothing is hidden (Hebrew *sathar*) from it (v. 6)
2. The Torah illuminates every aspect of life (vv. 8, 11)
3. The poet responds by asking for grace for hidden (*sathar*) faults (v. 12).

Other connections include the poet's wish to be whole, sound or perfect (*tamam*, v. 13) just as God's *torah* is perfect (*tamiym*, v. 7). Yet there is no spiritual pride or legalism here – the poet admits being attracted[36] to sins large and small, and asks to be cleansed. Lead me not into temptation, and deliver me from evil.[37]

Psalm 19 begins with a wide-angle lens focused on the universe. It then zooms in to human life and God's advice for it, and then concludes with a breath-taking close-up of one human heart and its redemption through a private relationship with God.

Links to Genesis

Psalm 19 draws imagery from Genesis, depicting heaven and earth, firmament and sun, day and night, God and human beings.[38] David Clines[39] argues that it uses Garden of Eden imagery by

comparing the *torah* to the tree of knowledge of good and evil. The *torah* revives life more than food can (Psa 19:10). The forbidden fruit seemed desirable (*nechemad,* Gen 3:6) to make a person wise, but *torah* is really desirable (*nechemad,* Psa 19:10[40]), and makes the simple wise (v. 7). The snake promised that the fruit would open Adam and Eve's eyes, but with sad irony their eyes only opened to the fact that they were naked and exposed – yet the *torah* really enlightens the eyes (Gen 3:5-7; Psa 19:8). To eat of the forbidden fruit means certain death, but the *torah* brings life and endures forever (Gen 3:3, 19; Psa 19:7, 9). So Psalm 19 subtly claims that the tasty, eye-opening, life-giving fruit humans really want is *torah* – God's life-giving Word.

Further, the three movements of Psalm 19 parallel the three major movements of Genesis 1-3.

1. In Genesis 1, *Elohim* speaks with mathematical precision, first day, second day, and so on. In Psalm 19, *El* is Creator of the heavens, and by implication, of the earth also.

2. In Genesis 2, *Yahweh* touches the first human face to breathe life into Adam. Genesis 1 and 2 have often been seen as contradictory accounts but, read together as they are placed in Scripture, they depict both the transcendent and immanent aspects of God. This is the same God, but viewed from different camera angles. In the second movement of Psalm 19, *Yahweh's torah* brings life (v. 7), and with it understanding.

3. Then in Genesis 3, humans sin and both humans and nature experience the Fall, with its devastating consequences. Yet God seeks them and promises to solve the problem caused by sin. The curse is still obvious in nature – thorns and thistles, painful birth, and so on – yet God promises redemption. Presumably God could have shorn a lamb and made them woolen garments, but instead God makes them garments of skin, signifying that death and blood were involved, again depicting the Lamb of God, slain from before the creation of the world (John 1:29, 36; Rev 13:8), who would come and give his life-blood for atonement. This may be suggested in the final lines of Psalm 19, which could well borrow the keywords "perfect" and "pleasing" from Leviticus 1:3-4, a text about lamb sacrifice.[41]

Finally and significantly, the poet prays that he will be innocent of "the great transgression." Scholars have understood "the great transgression" to mean many things – idolatry,[42] sun worship, rebellion, hubris, presumption, adultery, some specific great sin,[43] or the great variety of sins a person can commit. But Clines argues for a Genesis connection, proposing that Psalm 19:12-15, especially verse 13,[44] may be alluding to the Fall narrative, so that it would mean the fall of the human race – *the* great transgression. The poet then prays, "Don't let them [sins] rule me," using a word from God's command that Cain must rule over sin (Gen 4:7). So the poet personally longs for the innocence of Eden before the Fall when the consequences of the Fall did not curse the earth and its people. In the context of a poem about nature, he may be looking forward to a time when there is no more curse in the whole creation (*cf.* Rev 22:3; Rom 8:18-23).

So Psalm 19 seems to correspond to the movements of the Genesis Creation narrative: *El* creates heaven (and earth); *Yahweh* communicates with humans; *Yahweh* comes close as a personal rock and redeemer.

Natural and Special Revelation

Psalm 19 links the natural world and religion. This seems a bold move today, with some well-publicized scientists saying God is a delusion, and religion is like smallpox but harder to eradicate. Some religious people have acted as if science were threatening to faith, ignoring its logic and the technological blessings it provides and suggesting that scientists "must be crazy" to believe certain things. The media portrays a war between science and religion, when in fact a significant proportion of scientists believe in a personal God.[45] This psalm shows both nature and Scripture as revealing God, although in different ways: the heavens declare his glory, and the Torah reveals his moral laws, his will and his redemption.

Scholars have long spoken of the "book of nature" that reveals God, as does the Bible (God's "special revelation"). For example, Sir Francis Bacon (1561-1626), often called the father of the scientific method, wrote about two books, "first, the volume of the Scriptures, which reveal the will of God; then the volume of the Creatures, which express His power."[46] For Galileo Galilei (1564-1642), the book of nature was written in the language of mathematics, and astronomy could reveal God to those properly educated. He wrote that

> to prohibit the whole science [of astronomy] would be but to censure a hundred passages of holy Scripture which teach us that the glory and greatness of Almighty God are marvelously discerned in all his works and divinely read in the open book of heaven. . . . Within its pages are couched mysteries so profound and concepts so sublime that the vigils, labors, and studies of hundreds upon hundreds of the most acute minds have still not pierced them, even after continual investigations for thousands of years.[47]

Galileo's statement about Scripture is often quoted: "The intention of the Holy Spirit is to teach us how one goes to heaven, not how the heavens go." Yet Hess argues that this statement "should be interpreted in light of his conviction of the complementarity of the two books."[48] In making way for his new theory, Galileo did not seek to lessen the authority of Scripture, but to interpret Scripture differently.

More recently, of course, many have questioned whether indeed nature reveals languagelike thought or has an author. Yet Bible writers see nature as revealing God. For example, Paul, who quotes Psalm 19,[49] argues that

> since the creation of the world God's invisible qualities – his eternal power and divinity – have been clearly seen, being understood from what has been made, so that people are without excuse (Rom 1:20).

Paul argues that natural revelation is good enough for any person – Torah-enlightened Jew or ignorant Gentile, educated Greek or barbarian – to see that there is a God, yet Paul also describes people who ignored that truth and worshiped nature itself, with terrible moral and social consequences (Rom 1:21-25). It is important to note that Paul does not claim that nature reveals God's character and

will, but just his divine power. "Natural and special revelation complement one another, 'declaring' different facets of the one Revealer."[50] So the revelation in nature needs the special revelation of Scripture, for several reasons.

First, nature gives a silent, "indirect and mysterious witness," which often requires some logical deduction and inference, while Scripture speaks in (usually) clear words. Psalm 19 spells this out (in words): the wordless stars contrast with "the manifest, verbal message" of Torah.[51]

Second, nature does not reveal that God created it, so that some worship the stars rather than their maker. Nature is not brand-named with a cross. The first movement of Psalm 19, describing natural revelation, shows the heavens as God's handiwork, disagreeing with those who saw them as gods themselves, but does not name this God beyond the generic term *El*, which could be used of any god in the ancient world. When Yahweh is introduced in movement two, it is through *torah*. Put simply, nature can reveal that there is a powerful and divine Being, but in order to know the identity and character of that Being, another revelation is necessary – Scripture. The psalm says that natural revelation is brilliant, but God's written revelation in Scripture is "perfect" (Psa 19:7).

Third, the reason that nature does not perfectly reveal God is the Fall and the curse described in Genesis (3:14-19). This is important, as an example may show. I have two books called *Unintelligent Design*, which argue that because there are cruel and apparently incongruous things in nature – the AIDS virus, spiders with venom sacs, killer whales – the idea of an intelligent Designer is untenable. Logically, however, that does not follow because even a human system that is currently flawed, for example, a computer with a virus, can still provide evidence of great intelligence. And the Bible's argument from design is more subtle than that: it claims that nature, although fallen below God's original perfect creation, will one day be restored. This is the major metanarrative of the Bible – paradise lost and found. Yet nature cannot give us moral or redemptive messages: biology is red in tooth and claw,[52] and even the stars "do not reveal anything by way of ethical demands."[53] Psalm 19 fits within that perspective, claiming that nature reveals God's glory but that Scripture reveals God's moral character and his redemptive purpose.

So *torah* must interpret nature for us, and explain why it is as it is. This is a key insight for the contemporary age. Since Darwin, the pressure has been on Christian theology to accommodate, to revise itself to fit with Darwinism, to allow nature (or, more precisely, one interpretive lens placed upon nature) to reinterpret Scripture, even if Scripture must be twisted and forced into an unnatural pattern. Not to do so seems in our culture to be blind to nature and deaf to scientific orthodoxy – "Dawkins says it, I believe it, and that settles it." Yet anyone who reads the Bible, and is courageous enough to look for its most natural reading, has another authority – one that is not fallen. There is no question that God speaks in nature; but would it be sensible to allow fallen nature to rewrite the Bible, or is it more logical to let the Bible be the foundation for our understanding of nature?

Creative Challenge

At the time Psalm 19 was written, many people believed in the sun-god and in many other deities in nature. The sun-god Shamash was "often associated with justice and truth and enlightenment,"[54] so this poem playfully personifies the sun (Hebrew *shemesh*) as a bouncy bridegroom or athlete, but makes it very clear that God has pitched his tent or, dropping the metaphor, determined its place.[55] The poem transfers "attributes from the sun god to YHWH, the one God,"[56] making it crystal clear

that it is Yahweh God who enlightens in every sense, using the sun to achieve his purposes, and who executes justice. The poem's style may mimic hymns to various sun-gods,[57] but its worldview is very different: all nature is controlled by one Creator God.[58]

This Hebrew monotheism was actually a step towards authentic science. If one believes that there are many gods who control various aspects of the natural world and that their interaction with humans depends on whether one prays enough or gives enough, then one wouldn't bother to look for consistent laws in nature. But the Bible saw one God and expected one set of laws to govern all nature. Many of the great scientists also worked from this assumption. They expected nature to be logical and coherent, and expected the human mind to be able to understand it because the same Mind created both. Thus, science for Kepler could be "thinking God's thoughts after Him."

Psalm 19 creatively challenged the dominant worldview of its time – and it does so today. Most scientists today believe in one less god than monotheism. While also offering horoscopes based on recycled ancient superstitions, much of the mainstream media suggests that science has eliminated the need for any God at all, oversimplifying complex issues and presenting only one side of an unbalanced ongoing discussion. Some scientists see creationists as a Flat Earth Society composed of anti-intellectual faith-heads yet, as another chapter in this book reveals, a number of elite scientists – some believers, some not – are pointing to the widening cracks in the dominant paradigm. Some are seriously wondering whether the complex masterpiece of DNA spelling could have arisen by chance, beginning to question the standard models of the origin of life and the mechanisms of biological evolution. Some are not mere reflectors of these mainstream ideas, but reformers who read the plain meaning of Scripture without being simplistic or atavistic, and use it as a catalyst for original thought, which seeks to understand God's revelations in nature and in the Written Word.

You Are Here

After I spoke on Psalm 19 recently, a scientist said to me, "For years I was stuck in the first section – enjoying science and sensing there had to be a mind behind it, but not really knowing who or what that mind was, or anything about its name and character. Then I started checking out church, and gradually moved into section two, admiring the Bible and its moral code. Now I'm started into section three, speaking to God, asking for grace for my personal sins, beginning to know that he is *my* redeemer from sin, *my* rock in whatever life throws at me." I found his intuitive reading of this great psalm made me check my own personal connection with God.

Psalm 19 invites us to imagine a Creator big enough to fling out the universe with anthropomorphic fingertips, and challenges us to reflect on this incredible book of nature, prizing science and logic. It reveals a communicative God wise enough to guide our lives with his timeless Word and elegant laws, calling us to study *torah* with a humility and awe at God's own character and grandeur. And its final word rings with hope of an immeasurably rich relative who is gracious enough to come close and buy us out of slavery – the Lifegiver paying with his own life to make the universe "very good" once more, and to include all of us in it. It also challenges us to tell people of every language about God's greatness – as the stars do – and of his grace to all the fallen children of Adam and Eve.

> "They that be wise shall shine as the brightness of the heavens, and they that turn people to righteousness shall shine as the stars for ever" (Dan 12:3).

Notes and References

1. The author wishes to thank four peer reviewers (three astronomers and one Old Testament specialist), but accepts responsibility for any errors that may remain.

2. From an interview with Ken Campbell on the 1995 TV show *Reality on the Rocks: Beyond Our Ken*.

3. See Peter D. Ward and Donald Brownlee, *Rare Earth: Why Complex Life Is Uncommon in the Universe* (New York: Copernicus Books, 2000), and Guillermo Gonzalez and Jay W. Richards, *The Privileged Planet: How Our Place in the Cosmos Is Designed for Discovery* (Washington, DC: Regenery Publishing, 2004).

4. John C. Lennox, *God's Undertaker: Has Science Buried God?* (Oxford: Lion, 2009), 72.

5. Stephen Hawking and Leonard Mlodinow, *The Grand Design: New Answers to the Ultimate Questions of Life* (London: Bantam Press, 2010), 152-153.

6. See Hugh Ross, *Why the Universe Is the Way It Is* (Grand Rapids, MI: Baker, 2008) and www.reasons.org/fine-tuning (downloaded June 30, 2011), "Fine Tuning," number 38.

7. Dinah L. Moche, *Astronomy: A Self-Teaching Guide* (Hoboken, NJ: John Wiley & Sons, 2009), 87.

8. Ross, "Fine Tuning," numbers 1, 16.

9. Paul Davies, *The Goldilocks Enigma: Why Is the Universe Just Right for Life?* (London: Penguin, 2007), 163.

10. Hawking and Mlodinow, *The Grand Design*, 160.

11. Davies, *Goldilocks,* 166. He says they may not all be independent or require fine-tuning, but some do.

12. *E.g.,* Davies, *Goldilocks,* last chapter.

13. In his 1948 BBC debate with Frederick C. Copleston, S.J., on the existence of God.

14. Quoted in Jim Hold, "Nothing Ventured: A Bold Leap Into the Ontological Void," *Harpers*, November, 1994.

15. John Leslie, *Universes* (London and New York: Routledge, 1989), 13-15.

16. See Ross, *The Universe* and www.reasons.org/fine-tuning.

17. Estimating the number of atoms in the universe at 10^{80}.

18. Hawking and Mlodinow, *The Grand Design*, 135.

19. John Polkinghorne observes, "It's a metaphysical guess. It has mostly been popular and mostly been invented in order to explain away the fine tuning of our particular universe. If our universe is just one winning ticket in some vast multiverse collection, then somehow it seems less remarkable that it has all the properties it has. It's possible that God has chosen to create a number of different universes for a number of different divine purposes. You couldn't rule it out. But neither can you rule it in." Paul Fitzgerald, "An Interview With John Polkinghorne," www .religion-online.org/showarticle.asp?title=3510, downloaded June 28, 2011.

20. Fred Hoyle, "The Universe: Past and Present Reflections," *Annual Reviews of Astronomy and Astrophysics* 20, (1982), 1-35: 16, http://articles.adsabs.harvard.edu, accessed August 18, 2011.

21. Isaac Newton, *Newton's Principia; The Mathematical Principles of Natural Philosophy,* trans. A. Motte (New York: Daniel Adee, 1846), 501.

22. William Lane Craig, *Reasonable Faith: Christian Truth and Apologetics* (Wheaton, IL: Crossway Books, 2008), 96-156; Richard Swinburne, "The Cosmological Argument," in *The Existence of God* (Oxford: Clarendon Press, 2004), 133-152.

23. C. S. Lewis, *Reflections on the Psalms* (London: G. Bles, 1958), 56.

24. Peter Craigie, *Psalms 1-50* (Waco: Word, 1983), 179.

25. The Hebrew word "Torah" is often translated "law" but also includes the idea of "doctrine" *(The Jewish Encyclopedia),* kind instruction or teaching *(Theological Word Book of the Old Testament)* and "direction, instruction" *(The Brown Driver Briggs Hebrew and English Lexicon).* It can also refer to the five books of Moses, and in its broadest sense means revelation or even Scripture.

26. "This section is as national-specific as the first was universal." Benjamin J. Segal, *A New Psalm: A New Look at Age-old Wisdom*, http://psalms.schechter.edu/2010/06/psalm-19-from-heaven-to-torah-to-man.html, accessed June 22, 2011.

27. Franz Delitzsch, *Biblical Commentary on the Psalms*, vol. I (Grand Rapids, MI: Eerdmans, n.d.), 280.

28. See Lev 25:25-54. Boaz plays this role in the book of Ruth. The *goel* also sought justice if a relative was harmed.

29. Cf. Exod 6:6; 15:13; Job 19:25; Psa 19:15; 69:19; 72:14; 74:2; 77:16; 78:35; 103:4; 106:10; 107:2; 119:154; Prov 23:11; Isa 35:9; 41:14; 43:1, 14; 44:6, 22*ff.*; 47:4; 48:17, 20; 49:7, 26; 51:10; 52:3, 9; 54:5, 8; 59:20; 60:16; 62:12; 63:9, 16; Jer 31:11; 50:34; Lam 3:58; Hos 13:14; Mic 4:10.

30. Delitzsch, 280, calls this a "sharply sketched soteriology."

31. Some scholars have suggested the first section is borrowed from a hymn to the sun, and have not seen connections. Lewis, *Reflections*, 63, observes: "A modern poet could pass with such abruptness from one theme to another and leave you to find out the connecting link for yourself."

32. Arndt Meinhold, "Überlegungen zur Theologie des 19. Psalm," *ZTK* 80 (1983), 119-136. Michael Fishbane, *Text and Texture*, (New York: Schocken, 1979), 86.

33. As the gospel must do, Mark 16:15; Revelation 14:6. This may be Paul's point in Romans 10:18.

34. Perhaps the inner thoughts he is now expressing in music. Terrien argues that "meditations," can mean musical meditations on soft strings, *cf.* Psa 9:17; 92:4, Samuel Terrien, *The Psalms: Strophic Structure and Theological Commentary* (Grand Rapids, MI: Eerdmans, 2003), 214.

35. Konrad Schaefer, *Berit Olam: Psalms* (Collegeville, TN: Liturgical Press, 2001), 47.

36. Segal, "Psalm 19," n.p.

37. As Artur Weiser, *The Psalms: A Commentary* (London: SCM Press, 1962), 203.

38. Michael Wilcock, *The Message of Psalms 1–72* (Leicester: InterVarsity Press, 2001), 74, sketches these connections.

39. D. J. A. Clines, "The Tree of Knowledge and the Law of Yahweh (Psalm XIX)," *VT* XXIV, 1: 8-14

40. John Goldingay, *Psalms,* vol. 1, Psalms 1-41 (Grand Rapids, MI: Baker, 2006), 293, also observes this connection.

41. Segal, "Psalm 19," n.p.

42. Mitchell Dahood, *The Anchor Bible: Psalms 1, 1-50* (New York: Doubleday, 1966), 124.

43. Craigie, *Psalms 1-50*, 183.

44. Clines, "Tree of Knowledge," 13.

45. See Lennox, *God's Undertaker,* 17-18.

46. Francis Bacon, *The Advancement of Learning*, VI, 16, cited in Peter M.J. Hess, "Two Books," in *Encyclopaedia of Science and Religion,* http://www.enotes.com/science-religion-encyclopedia/two-books, accessed June 22, 2011.

47. Galileo Galilei, *Letter to the Grand Duchess Christina of Tuscany*, 1615, www.fordham.edu/halsall/mod/galileo/tuscany.asp, accessed August 18, 2011.

48. Hess, "Two Books," n.p. Galileo introduces the comment by saying he was quoting "something that was heard from an ecclesiastic of the most eminent degree," probably Cardinal Baronius.

49. In Romans 10:18, and Derek Kidner suggests the thought of Psalm 19 "may underlie the argument of Romans 1:18ff," *Psalms 1-72: An Introduction and Commentary on Books I and II of the Psalms* (London: InterVarsity Press, 1973), 97.

50. Craig C. Broyles, *Psalms* (Peabody, MA: Hendricksons, 1999), 108.

51. Hans Joachim Kraus, *Psalms 1-59* (Minneapolis, MN: Augsburg, 1988), 37-38.

52. *Ibid.,* 37-38: "Thus we should speak with caution and with reservations when referring to a revelation of God in the creation. What the created world says of itself is not necessarily a revelation of Yahweh."

53. Goldingay, *Psalms*, 298.

54. Nahum A. Sarna, *Text and Texture: Close Readings of Selected Biblical Texts* (New York: Schocken, 1979).

55. The poetic reference to the sun's path through the heavens (v. 6) has at times been interpreted as supporting an earth-centerd cosmology. Contemporary cosmology, of course, does see the sun as moving through the heavens, but the ancient text is perhaps best understood as using a commonly used expression from a human point of view. This could be compared to our use of the term "sunrise" when we know that the sun does not actually rise when we begin to see it.

56. Robert Alter, *The Book of Psalms: A Translation With Commentary* (New York: W. W. Norton, 2007), 62.

57. Kraus and others posit that the first section was once a Canaanite hymn, later converted (or subverted) to praise Yahweh. That textual history is interesting but cannot be proven either way, and the end result is a literary and theological unity, perhaps somewhat comparable to the different narratives in Genesis 1 and 2.

58. Craigie, *Psalms 1-50,* 181.